PEACE/WILLISTON
FISH & WILDLIFE
COMPENSATION
PROGRAM

BC hydro

BRITISH COLUMBIA

Butler Ridge Prescribed Burn, 1994

F. B. Corbould
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PWFWCP Report No. 190

The Peace/Williston Fish & Wildlife Compensation Program is a cooperative venture of BC Hydro and the provincial fish and wildlife management agencies, supported by funding from BC Hydro. The Program was established to enhance and protect fish and wildlife resources affected by the construction of the W.A.C. Bennett and Peace Canyon dams on the Peace River, and the subsequent creation of the Williston and Dinosaur Reservoirs.

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Website: *www.bchydro.bc.ca/environment/initiatives/pwcp/*

This report has been approved by the Peace/Williston Fish and Wildlife Compensation Program Fish Technical Committee.

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INTRODUCTION

To enhance habitats for grazing and browsing ungulates such as elk *(Cervus elaphus nelsonnii)* and moose *(Alces alces)*, the Peace/Williston Fish and Wildlife Compensation Program (PWFWCP) has conducted prescribed burning in the Peace and Finlay drainages of the Williston Reservoir watershed since 1989. Burning has generally been conducted on south facing slopes that are dominated by mature deciduous stands, primarily trembling aspen *(Populus tremuloides)*. By burning these stands the overstorey canopy is killed, thus allowing sunlight and precipitation to reach the forest floor to promote understorey growth; burning also releases nutrients into the soil which promotes vegetation growth. Consequently, grasses and shrubs in the understorey - which provide forage for ungulates - are able to flourish. Other wildlife species such as bears and songbirds that use or reside in these early seral communities, and species (e.g., woodpeckers) that feed or perch upon snags created by the burn can also benefit from prescribed burning.

Between 1989 and 1995, the PWFWCP conducted burns at 2 sites along the north shore of the Peace Arm: Aylard and Branham Slide (Zemlak et al. in prep, Wood 1996). Prior to 1989, BC Environment (BCE) burned sites along the Peace Arm (e.g., Bullhead Mountain, Dunlevy Lake; Backmeyer et al. 1992). In 1992 and 1993, prescribed burning was scheduled for two blocks on Butler Ridge (B4 and B5), but, due to poor weather and site conditions, burning was postponed in both years. In preparation for the 1992 burn, helicopter landing sites were constructed in block B5. In 1993, after recommendations made by Thompson (1992), vegetation plots were established near block B5 (control site A05) to aid in monitoring differences in vegetation composition and vigour between burned (treatment) and unburned (control) areas.

In May 1994, prescribed burning was carried out at the Butler Ridge site to enhance the area for elk, moose, mule deer *(Odocoileus hemionus hemionus)* and Stone's sheep *(Ovis dalli stonei)*. This report documents the prescribed burning activities that occurred in blocks B4 and B5 during 1994.

105-02035/

AREA DESCRIPTION

The Butler Ridge burn site, containing proposed burn areas blocks B4 and B5, is located at the south end of Butler Ridge along the north shore of the Peace Reach, Williston Reservoir watershed (Figure 1). The site is situated within the Dawson Creek Forest District (DCFD).

Block B4 (955 ha) comprises the south facing slopes of the Gravel Hill Creek drainage, and similarly block B5 (866 ha), approximately 2 km to the southeast, encompasses the south facing slopes and headwaters of the Cust Creek drainage (Figure 2). Both blocks extend from about 750 m to 1,350 m in elevation. Block B4 has a gentle to moderate slope (15-20%), whereas block B5 has slightly steeper terrain (25-30% slope). The *target* area was where fire ignition was to be initiated and concentrated.

Both proposed burn areas are located within the Hart Foothills Ecosection and extend across the moist warm and wet cool Boreal White and Black Spruce (BWBSmw1 and wk1 respectively) and the moist very cold Engelmann Spruce - Subalpine Fir (ESSFmv2) biogeoclimatic subzones (Thompson and Lacelle 1992; Figure 3); the BWBS subzones constitute more than 65% of both blocks. The areas are characterized by white spruce — fuzzy-spiked wildrye habitats in the BWBS (SRd in mw1 and SWs/SWd in wk1), and subalpine fir - black huckleberry (FH) , subalpine fir — scrub birch (FS) and subalpine fir — five-leaved bramble (FBc) habitats in the ESSF (Figure 3; Appendix A).

Moose, elk and mule deer wildlife capability ratings for habitats within the BWBS portion of the proposed burn areas range from class 1W (very high winter range capability) to 3W (moderate winter range capability) (Backmeyer 1994). Where south-facing rocky habitats intermix with other vegetated areas, Stone's sheep capability ratings are 3W. The proposed burn areas were, however, forested with young (20-60 years old) and mature (60-120 years old) aged stands, and therefore provided less than 80% of their forage capability for these species (Backmeyer 1994). By converting the forested stands to a shrub/grassland community - through the use of prescribed burning - these areas will be in a vegetative community that will be closer to their optimal forage condition (i.e., 100% of their capability) for these ungulate species (Backmeyer 1994).

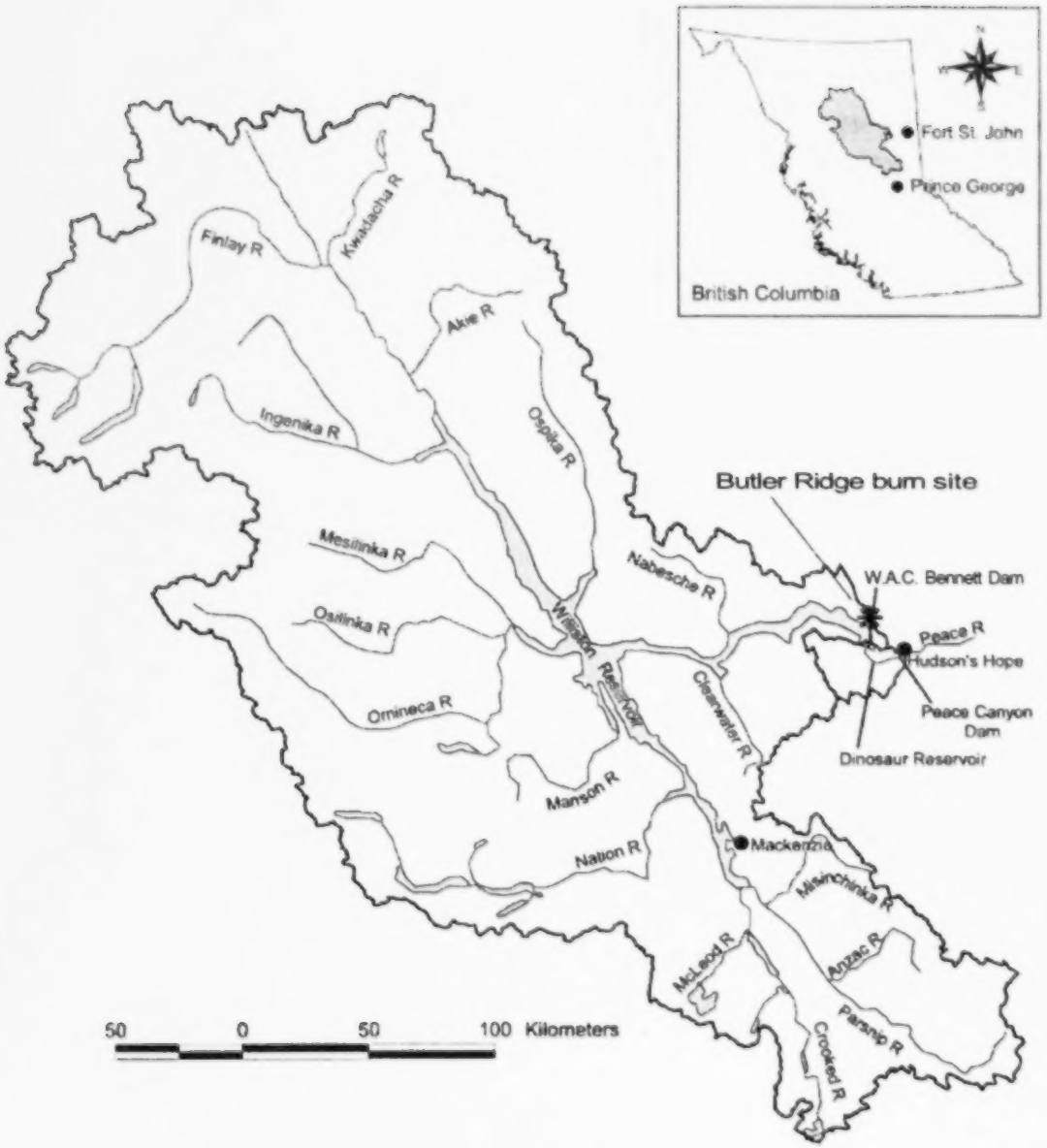

Figure 1. Butler Ridge burn site, Williston Reservoir watershed, May 1994.

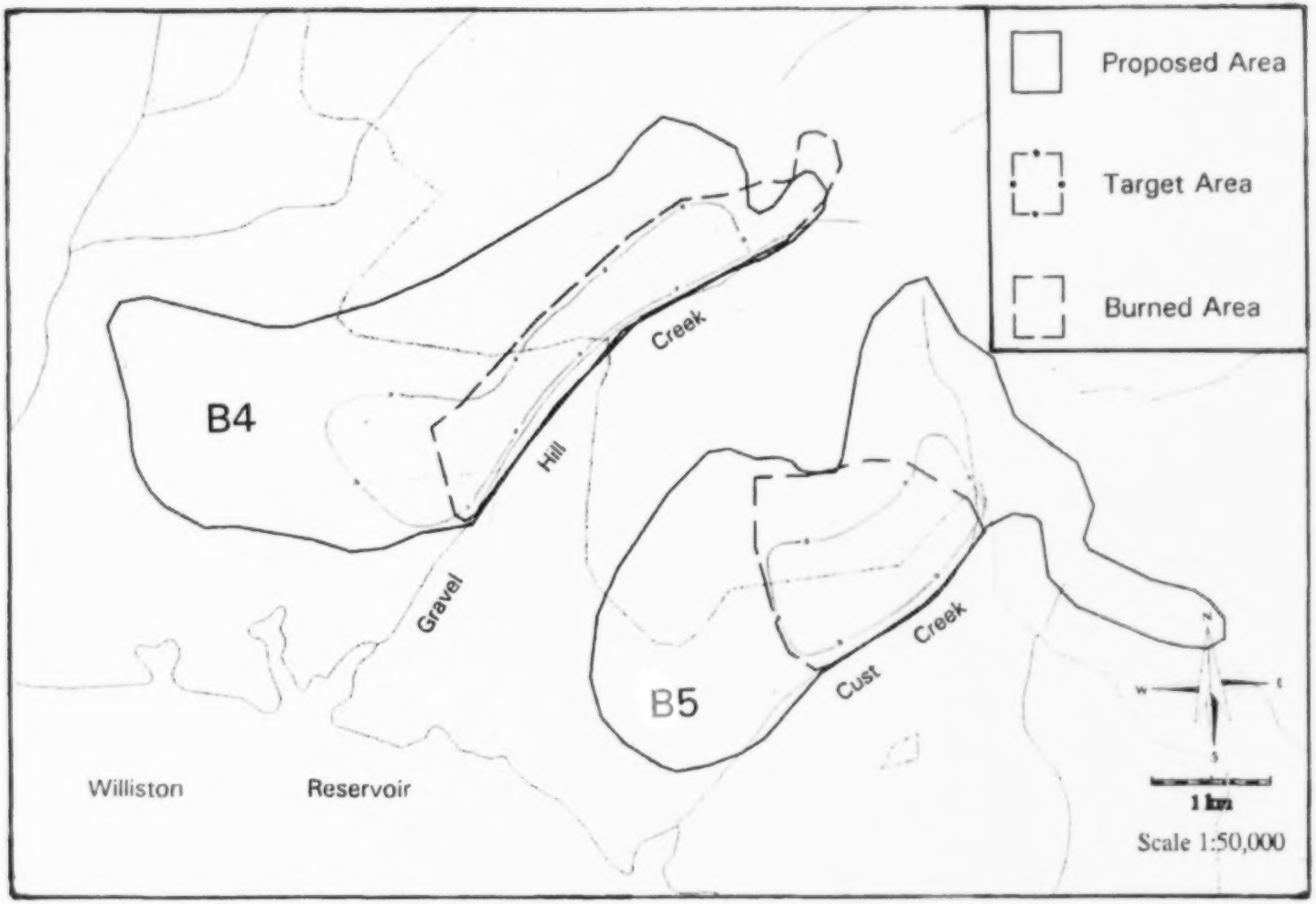

Figure 2. Blocks B4 and B5, Butler Ridge burn site, May 1994: proposed, target and burned areas.

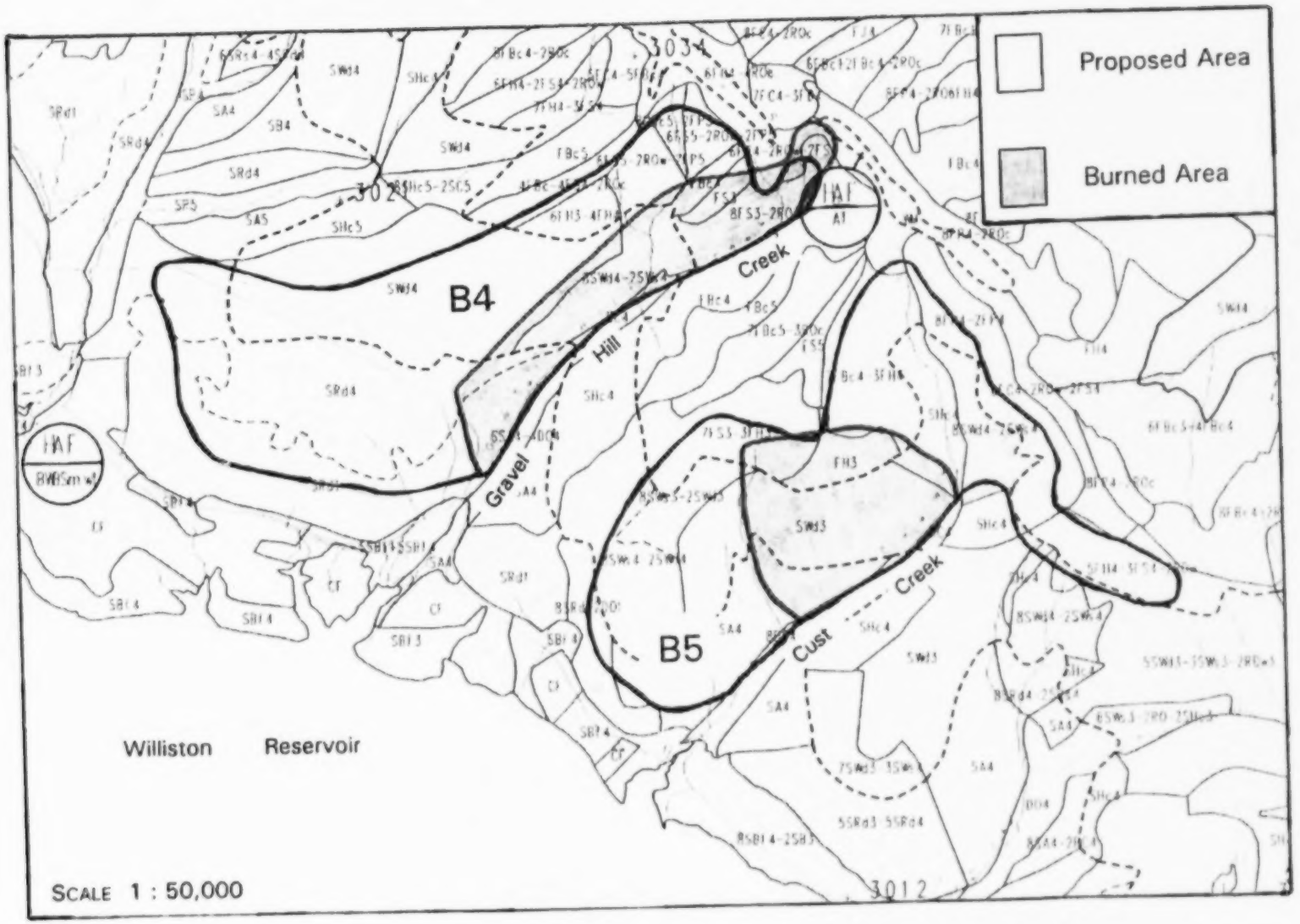

Figure 3. Biophysical habitat units of Butler Ridge burn site (blocks B4 and B5), May 1994.

BURN DETAILS

In early March 1994, a prescribed burning proposal for the two blocks on Butler Ridge was sent to the DCFD office for review (Appendix B). On 29 April and again on 6 May, pre-burn surveys of the proposed blocks were conducted by BCE staff (Peace Sub-region) in order to evaluate the site conditions and thus better determine when the prescribed burns should be initiated (e.g., presence of snow, helicopter pad status, fuel moisture levels). Also, on 29 April, a weather station to gather daily weather information was erected on the north shore of the Williston Reservoir at the mouth of Aylard Creek.

On 8 May, BCE and DCFD personnel - on behalf of the PWFWCP - commenced the prescribed burns at the Butler Ridge site with the ignition of block B4's target area at 1300 hr (Figure 1). Using a Bell 206 helicopter equipped with a machine to dispense aerial ignition devices (AID), AID were dropped primarily along Gravel Hill Creek, the southeastern edge of the target area. The burn carried well, resulting in most of the target area being burned. However, because the entire perimeter had not been ignited (i.e., burn originated from essentially a line ignition point), the constant source of fuel as it crept uphill enabled the fire to make uncontrolled runs up-slope to the northeast when high winds occurred the following day. Mop-up crews were therefore required on 10 May (6 people) and 11 May (9 people) as the fire spread into the subalpine and alpine habitats, outside the proposed burn area.

Following the burn, it was suggested that a majority of the mop-up costs would have been avoided if the entire proposed area was ignited at the commencement of the burn, thereby removing any fuel that could carry the fire to the northeast (Rod Backmeyer, BC Environment, personal communication). Similarly, if control measures had been established along the southwest perimeter of the target area (e.g., pre-burn along fence line that was present), the threat of a fire escape as it crept down the hill for two days would likely have also been avoided (Rod Backmeyer, BC Environment, personal communication).

The resulting burn at block B4 covered 261 ha with a perimeter of 10.1 km. Sixty-three percent (63%) of the burned area was in the BWBS (exclusively SR, SWd and SWs units), with the ESSF component primarily involving the FS habitat type (Figure 2).

Block B5 was ignited around 1500 hr on 8 May, shortly after the light-up on block B4 was completed. Ignition was concentrated on the target area, with the entire perimeter being ignited (Figure 2). The fire, therefore, remained relatively self-contained as it was able to create its

own convection; no mop-up work was required. Two hundred and thirty-six hectares (236 ha) of the 866-ha proposed area was burned, containing primarily the white spruce — highbush cranberry (SA) and SWd habitats in the BWBS, and the FH and FS habitats in the ESSF; over 75% of the burn occurred in the BWBS (Figure 2).. The burn perimeter totaled 5.9 km.

All costs (excluding BCE and DCFD staff wages) incurred during the preparation and execution of the prescribed burns were borne by the PWFWCP. A total of $31,759 was expended (Table 1), resulting in an average cost of $64 for every hectare of land burned. Vegetation monitoring was conducted the subsequent summer for an additional $2,000.

Table 1. Expenditures incurred by the PWFWCP to conduct prescribed burning activities at the Butler Ridge site (blocks B4 and B5), May 1994.

Pre-burn Assmt.	Aircraft Rental	AID	Mop-up Crew	PWFWCP Wages	Travel & Accom.	Post-burn Monitor.[1]	Other	TOTAL
1,848	15,311	630	8,831	1,741	500	2,882	16	$31,759

[1] Post-burn monitoring involved infra-red scanning of the burns and does not include the $2,000 spent on vegetation monitoring.

VEGETATION MONITORING

In July 1994, BCE personnel (Peace Sub-region) established plots and assessed the post-burn vegetation response at burned (treatment) and unburned (control) sites in and adjacent to block B4: site B14 (BWBS treatment), site B01 (ESSF treatment), and site B02 (ESSF control) (Appendix C). A control site in the BWBS (site A05), previously established near Danish Creek in 1993, was also monitored. The assessment measured the composition, abundance and vigour of plant species present. The degree of browsing on key plant species (e.g., willow *[Salix* spp.], red-osier dogwood [*Cornus stolonifera*]) by ungulate species was also recorded. Control and treatment sites are scheduled to be surveyed again in 2000 (Year 7) and 2003 (Year 10).

The Butler Ridge site will represent the Peace Arm drainage in assisting the PWFWCP to determine the success of prescribed burning in this portion of the Williston Reservoir watershed; other representative sites are being monitored in the Finlay drainage (Bevel Creek and Pelly Lake).

REFERENCES

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APPENDIX A. Descriptions for the dominant biophysical habitat classes within blocks B4 and B5 on Butler Ridge (from Thompson and Lacelle 1992).

Subzone	Biophysical Habitat
BWBSmwl:	SA and SRd
BWBSwkl:	SHc, SWd and SWs
ESSFmv2:	FBc, FH, FP and FS

Map unit labels:

habitat class

8 SWs 4

% of unit

successional stage

1. Shrub/herb
2. Pole sapling (<20 years old)
3. Young forests (20-60 years old)
4. Mature forests (60-120 years old)
5. Old growth forests (>120 years old)

SA	White spruce - highbush-cranberry cool aspect, steep slope habitat class					Biogeoclimatic Unit BWBSmwl
Description: steep slopes on deep to shallow morainal, glaciofluvial and colluvial materials; average moisture regime						
	Map Symbol	SA1	SA2	SA3	SA4	SA5
	Stage	Shrub-Herb	Pole Sapling	YoungForests	Mature Forests	Old Growth Forests
Successional Trends	Dominants	dense shrub cover of: willows trembling aspen paper birch highbush-cranberry bunchberry oak fern fireweed	dense forests of: white spruce highbush-cranberry bunchberry oak fern palmate coltsfoot	dense forests of: white spruce highbush-cranberry bunchberry oak fern palmate coltsfoot	dense forests of: white spruce highbush-cranberry bunchberry oak fern palmate coltsfoot dense moss layer	dense forests of: white spruce highbush-cranberry bunchberry oakfern palmate coltsfoot dense moss layer
	Associates	prickly rose black gooseberry twinflower trailing raspberry sweet-cicely bluejoint	trembling aspen paper birch Sitka alder black gooseberry twinflower trailing raspberry sweet-cicely	trembling aspen paper birch Sitka alder black gooseberry twinflower trailing raspberry sweet-cicely	trembling aspen paper birch Sitka alder black gooseberry twinflower trailing raspberry sweet-cicely	trembling aspen paper birch Sitka alder black gooseberry twinflower trailing raspberry sweet-cicely
Potential Winter Forage for Wild Ungulates	Abundant (above 15% cover)	willows highbush-cranberry	highbush-cranberry	highbush-cranberry		
	Moderate (5-15%cover)	trembling aspen paper birch prickly rose	trembling aspen paper birch willow prickly rose	prickly rose willow	highbush-cranberry	highbush-cranberry
Comments:						

SRd	White spruce - fuzzy-spiked wildrye warm aspect, deep soil habitat class.					Biogeoclimatic Unit BWBSmwl
Description: moderate to steep slopes on warm aspects; occurs on deep morainal and colluvial materials; drier than average soils						
	Map Symbol	SRd1	SRd2	SRd3	SRd4	SRd5
	Stage	Shrub-Herb	Pole Sapling	Young Forests	Mature Forests	Old Growth Forests
Successional Trends	Dominants	shrub/herb cover of: soopolallie common juniper saskatoon prickly rose showy aster fuzzy-spiked wildrye	open forests of: trembling aspen soopolallie common juniper prickly rose showy aster fuzzy-spiked wildrye	open forests of: trembling aspen soopolallie common juniper prickly rose showy aster fuzzy-spiked wildrye	open forests of: trembling aspen soopolallie common juniper prickly rose showy aster fuzzy-spiked wildrye	open forests of: trembling aspen soopolallie common juniper prickly rose showy aster fuzzy-spiked wildrye
	Associates	trembling aspen lodgepole pine white spruce paper birch red-osier dogwood creamy peavine kinnikinnick	lodgepole pine white spruce paper birch saskatoon red-osier dogwood creamy peavine kinnikinnick	lodgepole pine white spruce paper birch saskatoon red-osier dogwood creamy peavine kinnikinnick	lodgepole pine white spruce paper birch saskatoon red-osier dogwood creamy peavine kinnikinnick	lodgepole pine white spruce paper birch saskatoon red-osier dogwood creamy peavine kinnikinnick
Potential Winter Forage for Wild Ungulates	Abundant (above 15% cover)	fuzzy-spiked wildrye	fuzzy-spiked wildrye	fuzzy-spiked wildrye	fuzzy-spiked wildrye	fuzzy-spiked wildrye
	Moderate (5-15% cover)	prickly rose willows saskatoon red-osier dogwood	prickly rose	prickly rose willows saskatoon	prickly rose	prickly rose
Comments: common juniper is present on the limestone derived terrain						

SHc	White spruce - black huckleberry cool aspect habitat class					Biogeoclimatic Unit BWBSwk1
Description: steep slopes on cool aspects; occurs on lacustrine and morainal materials; moderate moisture regime						
	Map Symbol	SHc1	SHc2	SHc3	SHc4	SHc5
	Stage	Shrub-Herb	Pole Sapling	Young Forests	Mature Forests	Old Growth Forests
Successional Trends	Dominants	shrub/herb cover of: lodgepole pine white spruce willows Sitka alder red raspberry fireweed bunchberry palmate coltsfoot	open forests of: lodgepole pine trembling aspen white spruce Sitka alder black huckleberry fireweed bunchberry palmate coltsfoot	open forests of. lodgepole pine trembling aspen white spruce Sitka alder black huckleberry fireweed bunchberry palmate coltsfoot heart-leaved arnica	open forests of: lodgepole pine white spruce subalpine fir Sitka alder black huckleberry prickly rose bunchberry palmate coltsfoot heart-leaved arnica moderate moss cover	open forests of: white spruce subalpine fir Sitka alder black huckleberry prickly rose bunchberry palmate coltsfoot heart-leaved arnica moderate moss cover
	Associates	trembling aspen black huckleberry trailing raspberry tall bluebells sweet-cicely	subalpine fir highbush-cranberry willows heart-leaved arnica trailing raspberry	subalpine fir highbush-cranberry willows pink pyrola trailing raspberry	trembling aspen highbush-cranberry willows pink pyrola trailing raspberry	highbush-cranberry willows pink pyrola trailing raspberry
Potential Winter Forage for Wild Ungulates	Abundant (above 15% cover)	trembling aspen willows fireweed alsike clover	fireweed			
	Moderate (5-15% cover)		trembling aspen subalpine fir black huckleberry highbush-cranberry	subalpine fir black huckleberry highbush-cranberry	subalpine fir black huckleberry highbush-cranberry	subalpine fir black huckleberry highbush-cranberry
Comments						

SWd	White spruce - fuzzy-spiked wildrye warm aspect, deep soil habitat class				Biogeoclimatic Unit BWBSwkl
Description: moderate to steep slopes on warm aspects; occurs on deep morainal materials: drier than average moisture regime					
	Map Symbol	SWd1	SWd2	SWd3	SWd4	SWd5
	Stage	Shrub-Herb	Pole Sapling	Young Forests	Mature Forests	Old Growth Forests
Successional Trends	Dominants	shrub/herb cover of: Sitka alder red raspberry soopolallie, willows birch-leaved spirea Labrador tea prickly rose fireweed, bluejoint fuzzy-spiked wildrye	open forests of: lodgepole pine soopolallie prickly rose Labrador tea twinflower showy aster heart-leaved arnica	open forests of: lodgepole pine trembling aspen soopolallie prickly rose Labrador tea twinflower showy aster heart-leaved arnica	open forests of: lodgepole pine soopolallie prickly rose Labrador tea twinflower showy aster heart-leaved arnica	open forests of: white spruce lodgepole pine soopolallie prickly rose Labrador tea twinflower showy aster heart-leaved arnica
	Associates	bunchberry twinflower showy aster heart-leaved arnica lodgepole pine trembling aspen paper birch	trembling aspen birch-leaved spirea willows creamy peavine bunchberry bluejoint fuzzy-spiked wildrye	birch-leaved spirea willows creamy peavine bunchberry bluejoint fuzzy-spiked wildrye	trembling aspen birch-leaved spirea willows creamy peavine bunchberry bluejoint fuzzy-spiked wildrye	birch-leaved spirea willows creamy peavine bunchberry bluejoint fuzzy-spiked wildrye
Potential Winter Forage for Wild Ungulates	Abundant (above 15% cover)					
	Moderate (5-15% cover)	willows bluejoint fuzzy-spiked wildrye	willows bluejoint fuzzy-spiked wildrye	willows bluejoint fuzzy-spiked wildrye	willows bluejoint fuzzy-spiked wildrye	willows bluejoint fuzzy-spiked wildrye
Comments						

SWs	White spruce - fuzzy-spiked wildrye warm aspect, shallow soil habitat class				Biogeoclimatic Unit BWBSwk1
Description: moderate to steep slopes on warm aspects; occurs on shallow materials: drier than average moisture regime					
	Map Symbol	SWs1	SWs2	SWs3	SWs4	SWs5
	Stage	Shrub-Herb	Pole Sapling	Young Forests	Mature Forests	Old Growth Forests
Successional Trends	Dominants	shrub/herb cover of: Sitka alder red raspberry soopolallie, willows birch-leaved spirea Labrador tea prickly rose fireweed, bluejoint fuzzy-spiked wildrye	open forests of: lodgepole pine soopolallie prickly rose Labrador tea twinflower showy aster heart-leaved arnica	open forests of: lodgepole pine trembling aspen soopolallie prickly rose Labrador tea twinflower showy aster heart-leaved arnica	open forests of: lodgepole pine soopolallie prickly rose Labrador tea twinflower showy aster heart-leaved arnica	open forests of white spruce lodgepole pine soopolallie prickly rose Labrador tea twinflower showy aster heart-leaved arnica
	Associates	bunchberry twinflower showy aster heart-leaved arnica lodgepole pine trembling aspen paper birch	trembling aspen birch-leaved spirea willows creamy peavine bunchberry bluejoint fuzzy-spiked wildrye	birch-leaved spirea willows creamy peavine bunchberry bluejoint fuzzy-spiked wildrye	trembling aspen birch-leaved spirea willows creamy peavine bunchberry bluejoint fuzzy-spiked wildrye	birch-leaved spirea willows creamy peavine bunchberry bluejoint fuzzy-spiked wildrye
Potential Winter Forage for Wild Ungulates	Abundant (above 15% cover)					
	Moderate (5-15% cover)	willows bluejoint fuzzy-spiked wildrye	willows bluejoint fuzzy-spiked wildrye	willows bluejoint fuzzy-spiked wildrye	willows bluejoint fuzzy-spiked wildrye	willows bluejoint fuzzy-spiked wildrye
Comments						

FBc	Subalpine fir - five-leaved bramble cool aspect habitat class				Biogeoclimatic Unit ESSFmv2
Description: steep slopes on morainal and colluvial material; average moisture regime					
	Map Symbol	FBc1	FBc2	FBc3	FBc4	FBc5
	Stage	Shrub-Herb	Pole Sapling	Young Forests	Mature Forests	Old Growth Forests
Successional Trends	Dominants	shrub dominated cover of: Engelmann spruce subalpine fir scrub birch willows black huckleberry Labrador tea bunchberry bluejoint stiff club-moss dwarf blueberry five-leaved bramble	closed forests of: lodgepole pine Engelmann spruce subalpine fir white-flowered rhododendron black huckleberry Sitka alder fireweed mountain arnica bunchberry	closed forests of lodgepole pine Engelmann spruce subalpine fir white-flowered rhododendron black huckleberry Sitka alder fireweed mountain arnica bunchberry	open to closed forests of: Engelmann spruce subalpine fir white-flowered rhododendron black huckleberry bunchberry one-sided wintergreen stiff club-moss five-leaved bramble dense moss layer	open to closed forests Of: Engelmann spruce subalpine fir white-flowered rhododendron black huckleberry bunchberry one-sided wintergreen stiff club-moss five-leaved bramble dense moss layer
	Associates	lodgepole pine white-flowered rhododendron Sitka alder fireweed	black gooseberry willows dwarf blueberry tall bluebells	black gooseberry willows dwarf blueberry tall bluebells	lodgepole pine Labrador tea black gooseberry mountain arnica	lodgepole pine Labrador tea black gooseberry mountain arnica
Potential Winter Forage for Wild Ungulates	Abundant (above 15% cover)	scrub birch	black huckleberry	black huckleberry	subalpine fir white-flowered rhododendron black huckleberry	subalpine fir white-flowered rhododendron black huckleberry
	Moderate (5-15% cover)	willows	subalpine fir white-flowered rhododendron fireweed willows	subalpine fir white-flowered rhododendron fireweed willows		
Comments:						

FH	Subalpine fir - black huckleberry warm aspect, deep soil habitat class					Biogeoclimatic Unit ESSFmv2
Description: moderate to steep slopes on deep morainal materials; drier than average sites						
	Map Symbol	FH1	FH2	FH3	FH4	FH5
	Stage	Shrub-Herb	Pole Sapling	Young Forests	Mature Forests	Old Growth Forests
Successional Trends	Dominants	shrub dominated cover of: black huckleberry white-flowered rhododendron willows crowberry pink mountain-heather	open forests of: lodgepole pine black huckleberry white-flowered rhododendron crowberry pink mountain-heather	open forests of: lodgepole pine black huckleberry white-flowered rhododendron crowberry pink mountain-heather	open forests of: lodgepole pine black huckleberry white-flowered rhododendron crowberry pink mountain-heather moderate moss layer	open forests of: lodgepole pine black huckleberry white-flowered rhododendron crowberry pink mountain-heather moderate moss layer
	Associates	subalpine fir Engelmann spruce mountain arnica	subalpine fir Engelmann spruce mountain arnica	subalpine fir Engelmann spruce mountain arnica	subalpine fir Engelmann spruce mountain arnica	subalpine fir Engelmann spruce mountain arnica
Potential Winter Forage for Wild Ungulates	Abundant (above 15% cover)	black huckleberry white-flowered rhododendron	black huckleberry white-flowered rhododendron	black huckleberry white-flowered rhododendron	black huckleberry white-flowered rhododendron	black huckleberry white-flowered rhododendron
	Moderate (5-15% cover)	willows	subalpine fir	subalpine fir	subalpine fir	subalpine fir
Comments						

FP	Subalpine fir - pink mountain-heather upper elevation habitat class				Biogeoclimatic Unit ESSFmv2
Description: moderate to steep slopes in upper elevation positions, abutting the Alpine Tundra; shallow materials; drier than average moisture regime					
	Map Symbol	FP1	FP2	FP3	FP4	FP5
	Stage	Shrub-Herb	Pole Sapling	Young Forests	Mature Forests	Old Growth Forests
Successional Trends	Dominants	dense shrub cover of: subalpine fir scrub birch bunchberry pink mountain-heather bog-laurel	open forests of: subalpine fir scrub birch bunchberry pink mountain-heather bog-laurel	open forests of: subalpine fir scrub birch bunchberry pink mountain-heather bog-laurel	open forests of: subalpine fir scrub birch bunchberry pink mountain-heather bog-laurel	open forests of: subalpine fir scrub birch bunchberry pink mountain-heather bog-laurel
	Associates	lodgepole pine white-flowered rhododendron black huckleberry Labrador tea willows palmate coltsfoot	lodgepole pine white-flowered rhododendron black huckleberry Labrador tea willows palmate coltsfoot	lodgepole pine white-flowered rhododendron black huckleberry Labrador tea willows palmate coltsfoot	lodgepole pine white-flowered rhododendron black huckleberry Labrador tea willows palmate coltsfoot	lodgepole pine white-flowered rhododendron black huckleberry Labrador tea willows palmate coltsfoot
Potential Winter Forage for Wild Ungulates	Abundant (above 15% cover)	subalpine fir scrub birch	subalpine fir scrub birch	subalpine fir scrub birch	subalpine fir scrub birch	subalpine fir scrub birch
	Moderate (5-15% cover)	white-flowered rhododendron black huckleberry	white-flowered rhododendron black huckleberry	white-flowered rhododendron black huckleberry	white-flowered rhododendron black huckleberry	white-flowered rhododendron black huckleberry
Comments						

FS	Subalpine fir - scrub birch warm aspect, shallow soil habitat class					Biogeoclimatic Unit ESSFmv2
Description: moderate to steep slopes on shallow materials; drier than average moisture regime						
	Map Symbol	FS1	FS2	FS3	FS4	FS5
	Stage	Shrub-Herb	Pole Sapling	Young Forests	Mature Forests	Old Growth Forests
Successional Trends	Dominants	dense shrub cover of subalpine fir Engelmann spruce white-flowered rhododendron black huckleberry crowberry dwarf blueberry pink mountain heather	open forests of: subalpine fir Engelmann spruce white-flowered rhododendron black huckleberry crowberry dwarf blueberry pink mountain heather	open forests of: subalpine fir Engelmann spruce white-flowered rhododendron black huckleberry crowberry dwarf blueberry pink mountain heather	open forests of: subalpine fir Engelmann spruce white-flowered rhododendron black huckleberry crowberry dwarf blueberry pink mountain heather	open forests of: subalpine fir Engelmann spruce white-flowered rhododendron black huckleberry crowberry dwarf blueberry pink mountain heather
	Associates	scrub birch	scrub birch	scrub birch	scrub birch	scrub birch
Potential Winter Forage for Wild Ungulates	Abundant (above 15% cover)	white-flowered rhododendron	white-flowered rhododendron	white-flowered rhododendron	white-flowered rhododendron	white-flowered rhododendron
	Moderate (5-15% cover)	black huckleberry crowberry subalpine fir	black huckleberry crowberry subalpine fir	black huckleberry crowberry subalpine fir	black huckleberry crowberry subalpine fir	black huckleberry crowberry subalpine fir
Comments						

APPENDIX B. Prescribed burning proposal (site description and map) for Butler Ridge blocks: B4 and B5.

WILLISTON LAKE BURNING PLAN

Drainage / Area: BUTLER RIDGE

Block Numbers: B-4, B-5
Number of Hectares: 1811
Air Photo Number: 80010 #085, #086
Degree of Burning Difficulty: Class 3
Map Sheet: 94 B/1

Objective and Concerns:

Burn south facing slopes along the higher reaches of creek draws to increase sun and wind action. Ares in northeast corner on private land? (lot #1006)

Preburn Preparation:

Use creek draws as fire control line. Burn west end first,

Preburn:

Reburn at same time as main burn.

Light Up:

Begin ignition west side of blocks. Continue down along south boundary of blocks. Burn B-4 first if area burns well go on to B-5. (see plan on photo)

STOP AT THIS DRAW. SET FIRE. GROW FROM DRAW
LITE ALONG BASE OF HILL IN CREEK BED
BURN THIS AREA ONLY UNDER CONDITIONS OF LOW WIND
BUTLER RIDGE
PRIVATE LAND

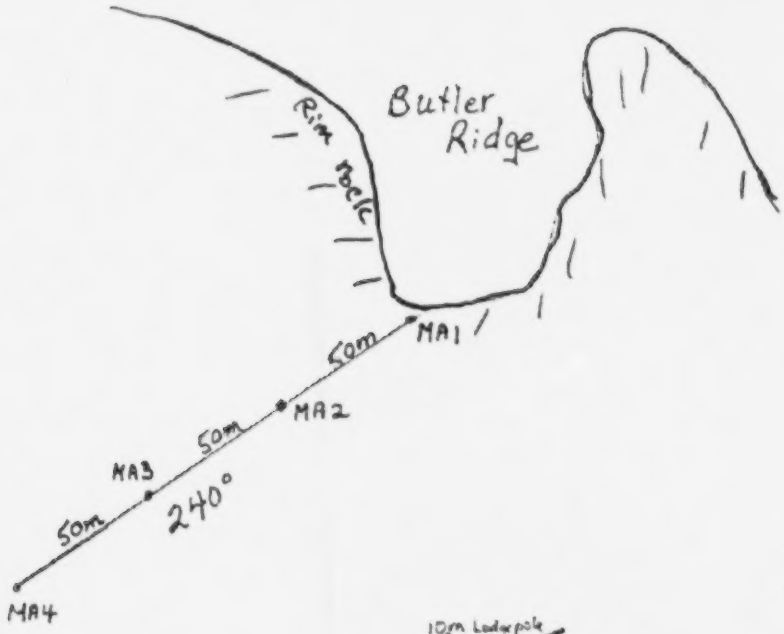
BC86047 .N9 058

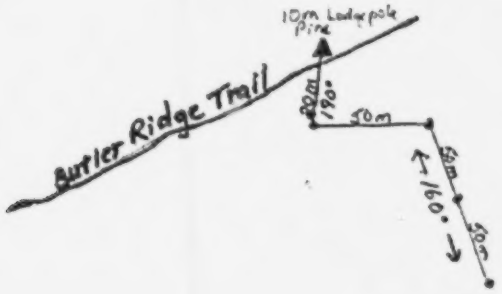
APPENDIX C Location and transect layout of low elevation (BWBS sites - A05 and B14) and high elevation (subalpine sites - B01 and B02) vegetation monitoring sites on Butler Ridge.

B02 (control)
B01 (burn)
B14 (burn)
A05 (control)
BUTLER
RIDGE
LAKE
94 B/1
1:50,000

GRAVEL HILL CREEK
HIGH ELEVATION BURN

B01 - BURN
PLOT 1 : N56° 09.03'
W 122° 15.00'
BRG. 240°



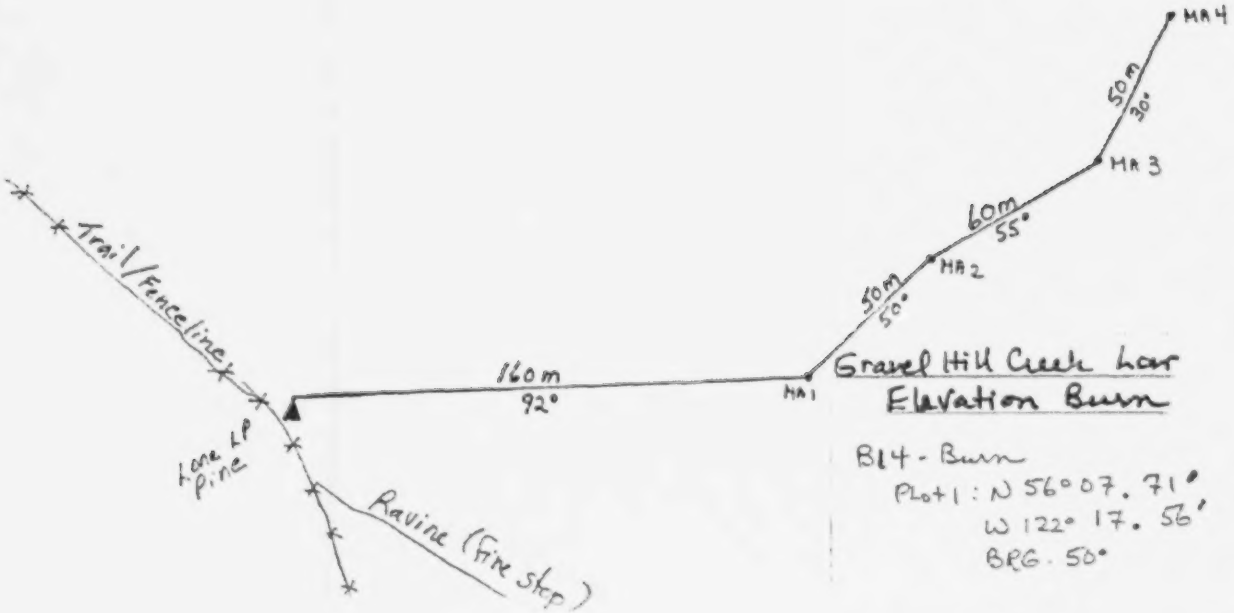


N

Gravel Hill Creek Control

B02 - Control
Plot 1: N56° 09.20'
W 122° 16.25'
BRG. 160°

N

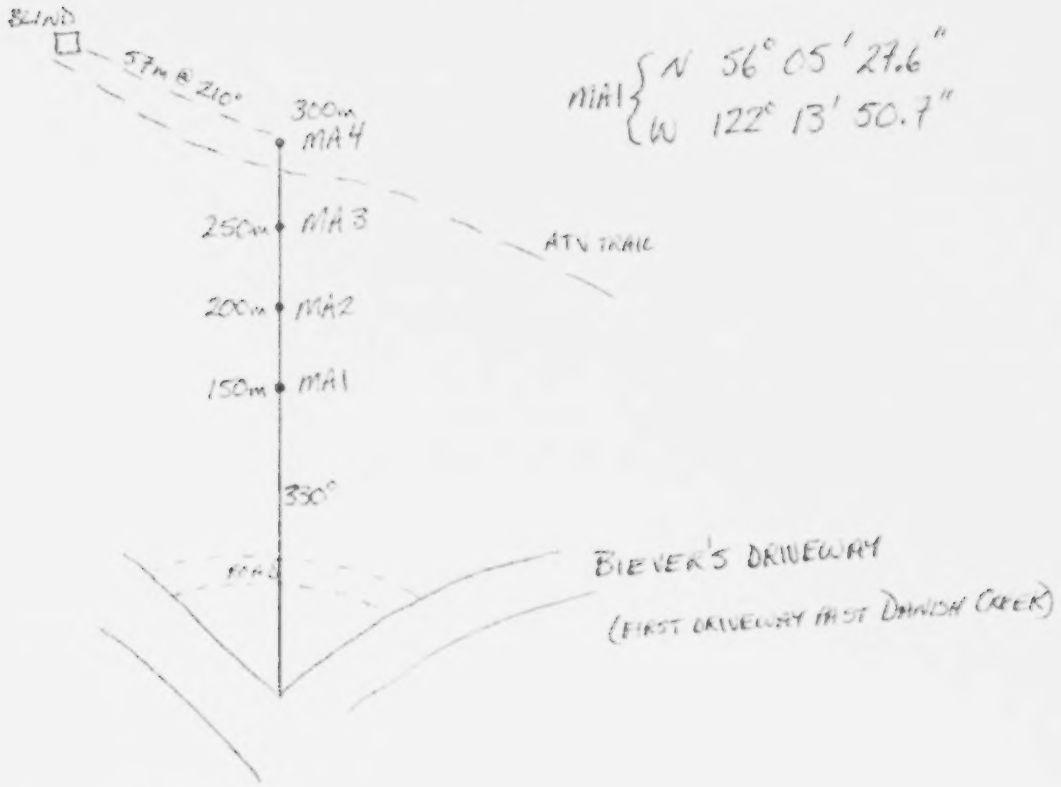


Gravel Hill Creek Low Elevation Burn

B14 - Burn
Plot 1 : N 56° 07. 71°
W 122° 17. 56'
BRG. 50°

BUTLER RIDGE CONTROL ACS

AUG. 11/93



MA1 { N 56° 05' 27.6"
W 122° 13' 50.7"